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MODELS FOR THE APPLICATION OF SYSTEMS ANALYSIS TO THE DELIVERY OF MENTAL HEALTH SERVICES.

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SYSTEMS ANALYSIS CAN BE APPLIED TO THE PLANNING AND DELIVERY OF MENTAL HEALTH SERVICES. THE MODELS PRESENTED SHOW HOW A SYSTEMS APPROACH CAN BE USED TO ANSWER SOME OF THE KEY QUESTIONS IN PLANNING, ORGANIZING, AND EVALUATING MENTAL HEALTH SERVICE PROGRAMS. MODEL 1 APPROACHES THE TASK OF DEFINING AND CATEGORIZING MENTAL HEALTH AND RELATED PROBLEMS. PROBLEMS ARE GROUPED AS BEING POLITICALLY DEFINED, SOCIALLY OR CULTURALLY DEFINED, AND INDIVIDUALLY DEFINED. MODEL 2 ASSESSES RESOURCES. IT PERMITS TYPES OF PERSONNEL AND INSTITUTIONS THAT ARE AVAILABLE TO PROVIDE SERVICES TO BE CROSS-REFERENCED TO TYPES OF INTERVENTION AND/OR SERVICES. AN EXAMPLE OF AN INFORMATION SYSTEM THAT MAY BE USED TO DEVELOP DATA ON NEED FOR SERVICES IN TERMS OF "USER REQUIREMENTS," MODEL 3 IS A DIAGRAMMATIC REPRESENTATION OF THE FLOW OF INFORMATION IN A COUNTY-WIDE DATA BANK ON CURRENT USERS OF SERVICES. A SERIES OF CHARTS CONSTITUTE MODEL 4, WHICH ILLUSTRATES A METHOD FOR DETERMINING THE CRITICAL PATHWAY OF AN INDIVIDUAL THROUGH THE CARE-GIVING SYSTEM. THE LINKAGE AMONG AGENCIES AND THE CHANNELS ALONG WHICH PEOPLE ARE PROCESSED IS SHOWN IN MODEL 5. THE FINAL MODEL DEMONSTRATES HOW THE ELEMENTS IN A MULTI-SERVICE FACILITY ARE LINKED WITH ONE ANOTHER IN TERMS OF PEOPLE WHO COME FOR HELP. THIS PAPER WAS PRESENTED AT THE 45TH ANNUAL MEETING OF THE AMERICAN ORTHOPSYCHIATRIC ASSOCIATION (CHICAGO, MARCH 20-23, 1968). (CG)

MODELS FOR THE APPLICATION OF SYSTEMS ANALYSIS TO THE DELIVERY OF MENTAL HEALTH SERVICES

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Mental health service programs often have been developed on the basis of inadequately specified goals, and without sufficient consideration of the totality of need for helping services on the part of the target population. Evaluation of many such programs has been confined to measuring the quantity of service rendered, rather than the impact of the service on problem areas. A systems approach offers a logical basis for defining objectives in operational terms, and for planning programs and organizing services to meet changing needs.

What is a "systems approach"? It can perhaps be identified more readily by its absence than its presence. One or two negative examples should suffice. In the early 1940's, officials in an Eastern city called in a group of advisers to help them plan a housing project. They were told to build only small apartments, because the American family was getting smaller. This trend, of course, was soon reversed, and it never was a strong trend in the lower socioeconomic groups for whom the housing was designed. More recently, the same city again consulted housing advisers. This time they were told to build a project with nothing but three bedroom apartments--the American family was getting larger. And so they built a project with only three-bedroom apartments. But the concentration

of so many large families in one place has overtaxed the school facilities and the recreational facilities, to say nothing of the temper of the residents subjected to hordes of young children at close quarters. The planners altered one factor without considering its effects on other factors. A somewhat similar situation occurred during World War II when American military forces occupying some of the South Pacific islands hired young native workers at such high salaries that they upset the local economy and the local authority structure. The elders, who had kept the local society stable, could no longer command the respect of the community.

Lack of a systems approach amounts to tackling problems one at a time and making expedient solutions without regard to related consequences throughout the system. It is perhaps the answer to the Zen Buddhist koan (a riddle, contemplation of which is intended to promote satori or enlightenment) which asks: "What is the sound of one hand clapping?" The sound of one hand clapping is a striking metaphor for the failure to deal with all related elements of a given problem or system; it can become a loud sound in terms of social disruption. The systems approach attempts to overcome this failing. It tries to fit together the pieces of the "jigsaw puzzle," and to deal with all aspects of a given system as a totality.

What is a system? A system can be defined as a set of elements organized to perform a set of functions in order to achieve desired results. An element is a set of resources organized to perform a highly integrated subset of the desired system of functions. A systems

approach is a logical way of examining and trying to solve problems. It attempts to "map the territory," to show interrelationships among elements in the system (or organization), and to identify operations basic to the mission of the organization. The systems approach stresses decision points and relations among various functions of the organization. It especially focuses attention on operations and functions for which information requirements are not well defined or are not being adequately met.

The systems approach involves the use of a whole family of systems engineering and operations research techniques for systems analysis, systems design, systems simulation, and testing. This paper is confined to models related to delivery of mental health services, to systems analysis and design; it does not deal with simulation and testing.

The models attempt to show how a systems approach can be used to arrive at working answers to the following key questions in planning, organizing, and evaluating mental health service programs: (1) How can the goals of mental health programs be defined in quantifiable terms? (2) How does the currently organized network of services process individuals with problems, and how successfully do the services accomplish the stated goals? (3) What are the critical decision points in the care-giving system, and what kinds of information are required to make decisions which will lead to accomplishment of specific program goals? (4) What methods can be used to develop a family-oriented information system for indicating specific user requirements? (5) How can a tracking system be established to follow individuals through the community service network? (6) Within a multiservice facility, what methods can be used to keep track of who did what to whom, and with what effect?

Defining the Problem

Model 1[1/] approaches the task of defining and categorizing mental health and related problems in terms which will help the mental health agency to decide how large a territory of problems it will attempt to deal with, and what kinds of problems it will concentrate on. The model assumes that the community is the ultimate client of the program, and that the program (whether it is public, private, or voluntary) has been established to cope with difficulties that are of pressing concern to the majority of people in the community. Problems are grouped as being politically defined, socially or culturally defined, and individually defined. Within each category, problems are subgrouped as being direct mental health problems or related problems. (NOTE: This model does not attempt to be exhaustive in its listing of problems. Like many of the other models in this paper, it is presented as a method for systems analysis, rather than as a completed program planning tool.)

Some problems, like mental illness and mental retardation, appear in all three categories. Some, like hostile behavior, may be culturally defined as emotional problems, but, under some circumstances, constitute politically defined offenses. Some problems, like alcoholism and drunken driving, may oscillate between being mental health or related problems and, depending upon severity and environmental conditions, between being individually, culturally, or politically defined problems. The compulsive

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[1/] Model 1 derives in part from discussions of theoretical formulations with Dr. David J. Vail, Medical Director, and Dr. Arthur S. Funke, Director of the Mental Health Study and Planning Program, Medical Services Division, Minnesota Department of Public Welfare.

drinker who cannot hold down a job and support his family usually becomes a social problem; if he is caught driving while intoxicated, regardless of the degree of his social adjustment, he can be prosecuted for a criminal offense. The person suffering from an anxiety neurosis or going through an especially painful period of bereavement is categorized as having a mental health problem as defined by himself and/or his family. If the severely depressed person makes a suicidal attempt, he soon becomes recognized as a problem by the general community and by the local authorities.

It is obvious that this model does not simplify the complex interrelationships of people with problems and those who try to do something about the problems. The model does attempt to expose and clarify some of these complexities, so that it may assist the mental health program in making a systematic appraisal of problem areas and setting specific goals and priorities.

Assessing the Resources

Model 2 deals with an assessment of the resources. It permits types of personnel and institutions that are available to provide services to be cross-referenced to types of intervention and/or services that may be required to deal with mental health and related problems.

Institutions and personnel are grouped into three categories: public agencies, private agencies, and independent professional workers. Types of intervention and services are subdivided into nine categories: acute emergency; diagnosis; referral; counseling; financial aid; treatment (outpatient, combination, or inpatient); incarceration (inmate or minimum security);

caregiving for vulnerable groups, such as the very young, the old, the physically and mentally impaired (institutional care, foster care, or home services); and habilitation and rehabilitation, including educational, vocational, physical, social, and recreational services, as well as probation and parole.

The model is essentially an inventory model, and can be used to assess the degree to which existing resources are available to fill various types of need. This model also can be used as a prototype for a model to track individuals through the local service network. (See Model 4.)

Assessing the Needs

Model 3 is one example of an information system that may be used to develop data on need for services in terms of "user requirements." It is simply a diagrammatic representation of the flow of information in a county-wide data bank on current users of services, pooled and compiled on a family basis. To the extent that such a data bank is confined to information about current users, it assesses need in terms of the framework or structures in which services are provided as much as in terms of user requirements. It does have another advantage, however, for a different purpose. Pooled information can be made available to the staff of any one contributing agency, obviating the need for extensive and probably incomplete solicitation of information from other relevant agencies each time a new client applies for service.

Other methods of assessing need should be mentioned her.. These include epidemiological studies, health surveys, analysis of census data,

and psychiatric and similar registers. A life crisis model also can be used, in which community needs for intervention at critical life junctures (birth, marriage, death, school crises, and the like) can be estimated on the basis of demographic data.

Tracking the Individual Through the Caregiving System

Model 4 consists of a series of charts illustrating a method for determining the critical pathway of an individual through the caregiving system. These charts follow the individual in terms of services rendered and/or actions taken. The purpose is to show what happens to people at critical points, who makes the decisions about what kinds of service or care they should be given, and what kinds of decisions are made. The charts show, on the vertical axis, the agencies or individuals who might make the decisions or render the service. The horizontal axis lists five critical periods: emergency action, diagnosis and referral, treatment, rehabilitation, and follow-up. The charts can be adapted to show time intervals between these critical periods (and possible hiatuses in service) through the insertion of dates when each period begins and ends.

The mentally ill person's first encounter with the network may be the police, a minister, a physician, or an outpatient mental health facility. The decision as to where he will be sent for diagnosis and referral will depend on the facilities available, the information available to the person called on for emergency action, the linkage or lack of linkage among community agencies, and other local factors. Thus, in some communities, police may hold the ill person in a local jail until he can be transferred

to the mental hospital for diagnosis and referral. In other communities, diagnosis and referral are made by a court at a commitment hearing, and there is no mental health intervention until the treatment stage begins at the mental hospital. If emergency action is taken at a community based health facility (general hospital, mental health clinic or center), the likelihood is greater that diagnosis and treatment will occur in the community.

The alcoholic who is caught driving while intoxicated will be sent to a court for diagnosis and referral, with perhaps detours to a lawyer and a local jail on the way. The court may decide that he is to be treated at a correctional institution or placed on probation and treated in a mental health setting. Follow-up for the alcoholic may be in the legal rather than in the health sector of the caregiving system.

Similar charts can be used to track the pathway of the drug addict, the sex offender, the juvenile delinquent, the indigent, the victim of family breakdown, and others. This model can be used to identify the people who come for help, the places where they seek that help, and the kinds of problems for which they seek help. It spotlights the critical points at which information is required and the people who need that information. The model also can be used to ascertain why certain kinds of decisions are made and, if they are undesirable, to indicate how they may be changed. Changes can be effected by (1) providing better information, consultation, or other assistance to the decision-maker, and/or (2) introducing changes in the structure of the network so that someone else or some other agency makes the decision at one or more of the critical points. For example, if the mentally

ill are being committed to the hospital without prior mental health intervention, it may be possible to arrange with the judge to refer them to a mental health center for care during the period of legal proceedings. Another alternative might be to transfer the diagnosis and referral decision from a legal to a health authority. From the overall community point of view, such a change might be highly desirable even if it did not benefit the ill person. It would be removing a sizeable burden from an already overtaxed court system which is not particularly equipped to make this type of decision.

Analyzing the Present Caregiving System

Model 5 charts the flow of people with mental health and related problems to and through the web of services performed by different sources of help. The emphasis in these charts is on the linkages among agencies in the network, and the channels along which people are processed. This model makes it easier to visualize the complex pathways and the many official and non-official agencies likely to be involved in providing help.

The first chart is a simplified diagram of pathways to mental health care, starting with self-referral. Model 5A shows another possible circuit in the system if family referral against the patient's wishes is involved. The system might start with school referral of children, with public intervention for severe acting-out behavior in public, or with any one of a number of other subsystems. A separate flow chart could be drawn to chart the interrelations of agencies included in the box labelled "Welfare, rehabilitation, health, and similar caregiving services" in Model 5.

Similar charts can be drawn to analyze the flow of people through the network of agencies when intervention is initiated because of delinquency, adult crime, indigency, handicapping accidents, etc. Such charts make it easy to visualize existing interagency channels, to point up needed changes in those channels, and to indicate what the new pathways would look like. These flowcharts are an essential prelude to use of computer simulation to study effects of changes in the system.

Linking the Elements of a Multi-Service Facility

Model 6[2/] illustrates how the elements in a multi-service facility, such as a comprehensive community mental health center, are linked with one another in terms of people who come for help. It can be used to develop an interlocking system of information consisting of diagnosis at intake, admission and/or referral, referral follow-up, flow and time within facility program areas, work with the family, prognosis at time of discharge, outcome, and follow up. A system such as that suggested in Model 6 also may help the mental health agency to relate its activities and priorities to the desires, requirements, and expectations of other community agencies. Model 6A[3/] charts the possible flow patterns within a mental health center's different facilities. Special problems will arise in maintaining records of this flow because some patients will straddle two or

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[2/] Parts of Model 6 were suggested by Dr. Alice Tobler, Director, Division of Planning, Maryland Department of Mental Hygiene.

[3/] Models 6A and 6B were developed by Dr. Philip H. Person, Chief, Special Area Studies Section, Biometry Branch, National Institute of Mental Health.

more categories: the outpatient may get treatment in the partial hospitalization unit for several days, the partial hospitalization patient may receive some of his treatment in the inpatient department or may receive therapy in the outpatient unit. Model 6B[3] indicates how three separate data systems--one for the patient, one for the type of service, and one for each staff member--can be used to gather and record information on who did what to whom. In this model, mutually exclusive categories for patient status must be established, and patient status data kept separate from data about the services received.

Summary

This paper has attempted to show how systems analysis can be applied to the planning and delivery of mental health services. It stresses the kinds of critical issues that must be considered in organizing such services and evaluating their effectiveness. The models provide a logical series of steps for gathering data, resolving key issues, and deciding on objectives and priorities. The models are merely a skeleton. Additional studies will be needed, particularly to assess needs. A considerable amount of flow charting will be required to fully analyze the present caregiving system and to achieve a reasonably complete set of charts tracking the more common pathways of individuals through the caregiving system. Flow charting the linkages between the mental health center and other community agencies will raise critical problems about coordination that may help clarify issues about agency objectives and priorities. The

method described in this paper may appear to be no more than organized common sense, a logical approach to a set of problems. That is precisely what systems analysis is all about.

November 1967

Model 1

DEFINING THE PROBLEM

Individually Defined (including family)

- **Mental Health**
  - Mental illnesses
  - Mental retardation
  - Anxiety
  - Compulsive behavior
  - Depression
  - Bereavement
  - Excessive drinking
- **Related**
  - Poverty
  - Work problems
  - Child rearing problems
  - Marital problems and divorce
  - Slow learners
  - Physical handicaps

Socially or Culturally Defined

- **Mental Health**
  - Mental illnesses
  - Mental retardation
  - Sex offenses
  - Hostile behavior
  - Suicide
- **Related**
  - Crime and delinquency
  - Poverty
  - Excessive drinking
  - Unemployment
  - School dropouts
  - Drug addiction
  - Family planning
  - Family breakdown

Politically Defined

- **Mental Health**
  - Mental illnesses
  - Mental retardation
  - Sex offenses
  - Alcoholism
  - Drug addiction
- **Related**
  - Crime and delinquency
  - Indigence
  - Drunken driving
  - Unemployment
  - Homicide
  - Hostile behavior in public
  - Social unrest
  - Mass violence
  - Child neglect and/or abuse
  - Truancy

Model 2

ASSESSING THE RESOURCES

Institutions and Personnel

Public Agencies:

- Mental hospitals
- Institutions for handicapped
- M.H. centers and clinics
- Health agencies & departments
- School systems
- Welfare agencies
- Housing agencies
- Police
- Court system (including parole & probation)
- Correctional system
- Youth services
- Employment services
- Rehabilitation services
- Recreational services

Private Agencies:

- Hospitals
- M.H. centers and clinics
- Nursing homes
- Social service agencies
- Churches
- Employment services
- Rehabilitation services
- Recreational services

Types of Intervention and/or Services

Handling Acute Emergencies | Diagnosis | Referral | Counseling | Financial Aid

Treatment: O.P. | Comb. | Inpat.

Incarceration: Inmate | Minimum Security

Caregiving for Vulnerable Groups (young, old, physically and mentally impaired): Inst'nl Care | Foster Care | Home Services

Habilitation and Rehabilitation (educational, vocational, physical, social & recreational, probation & parole)

Model 2

ASSESSING THE RESOURCES

Institutions and Personnel

Independent Professional Workers:

- Psychiatrists
- Psychologists
- Social workers
- Nurses
- Physicians
- Lawyers
- Ministers
- Counselors

Types of Intervention and/or Services

Handling Acute Emergencies | Diagnosis | Referral | Counseling | Financial Aid

Treatment: O.P. | Comb. | Inpat.

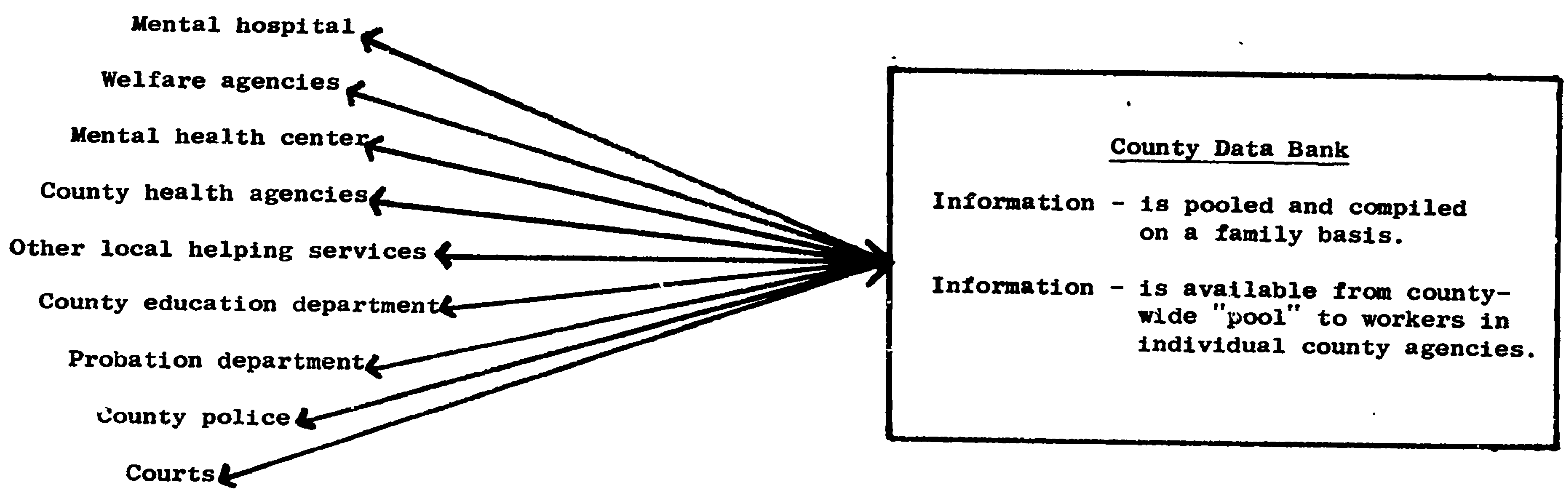
Incarceration: Inmate | Minimum Security

Caregiving for Vulnerable Groups (young, old, physically and mentally impaired): Inst'nl Care | Foster Care | Home Services

Habilitation and Rehabilitation (educational, vocational, physical, social & recreational, probation & parole)

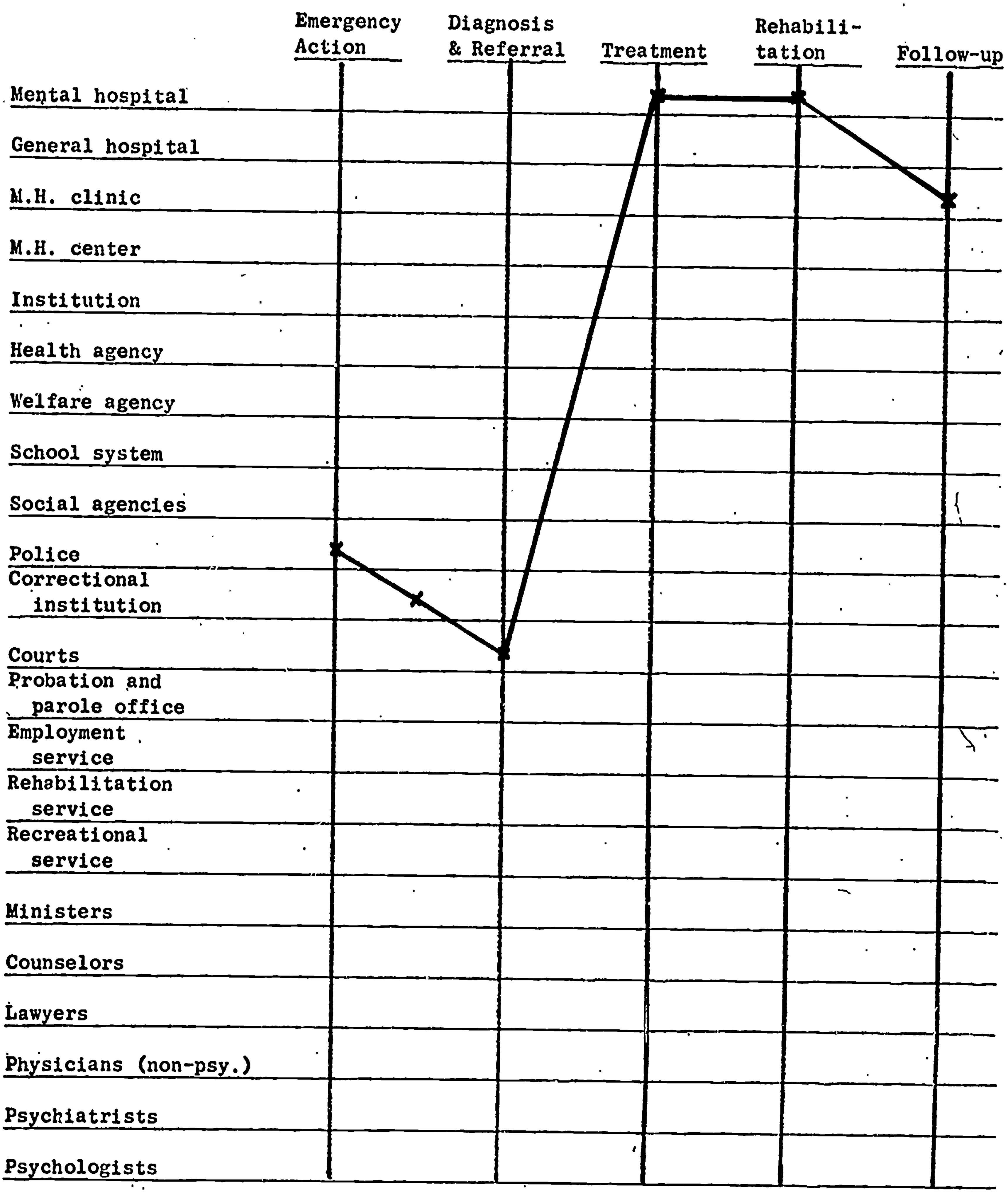
Model 3

ASSESSING THE NEEDS



Model 4

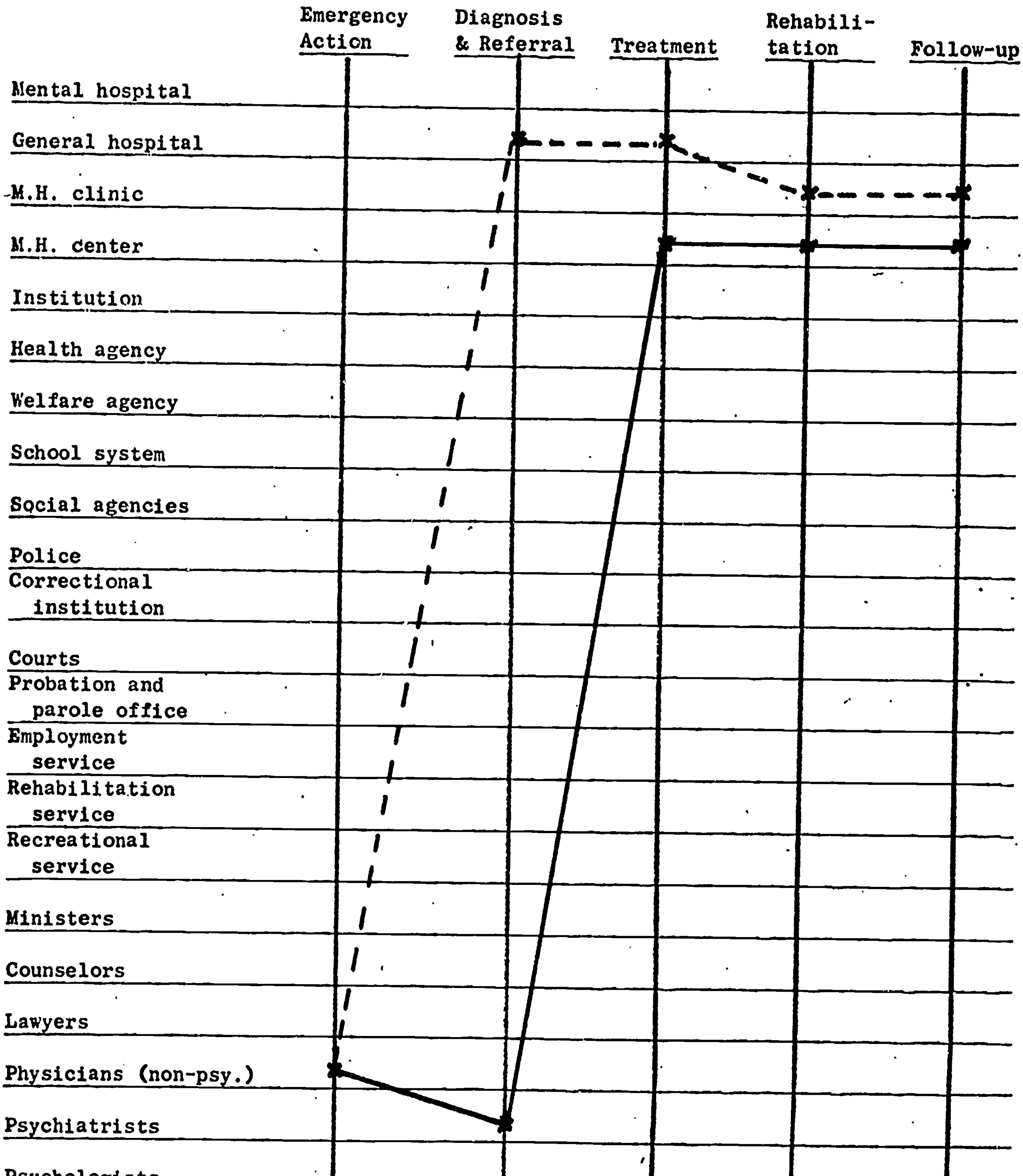
TRACKING THE INDIVIDUAL THROUGH THE SYSTEM



Pathways for the mentally ill.

Model 4

TRACKING THE INDIVIDUAL THROUGH THE SYSTEM



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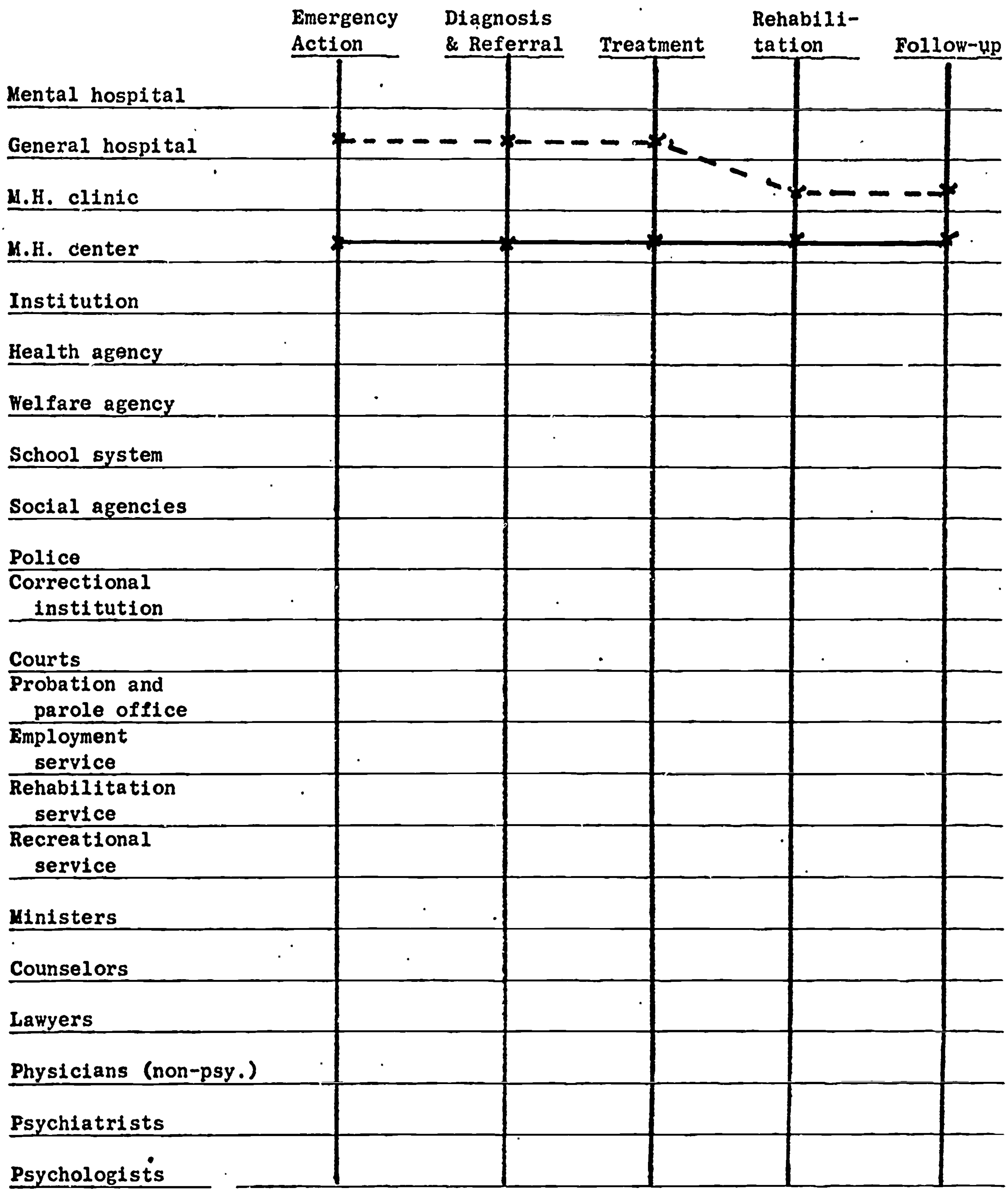

Pathways for the mentally ill.

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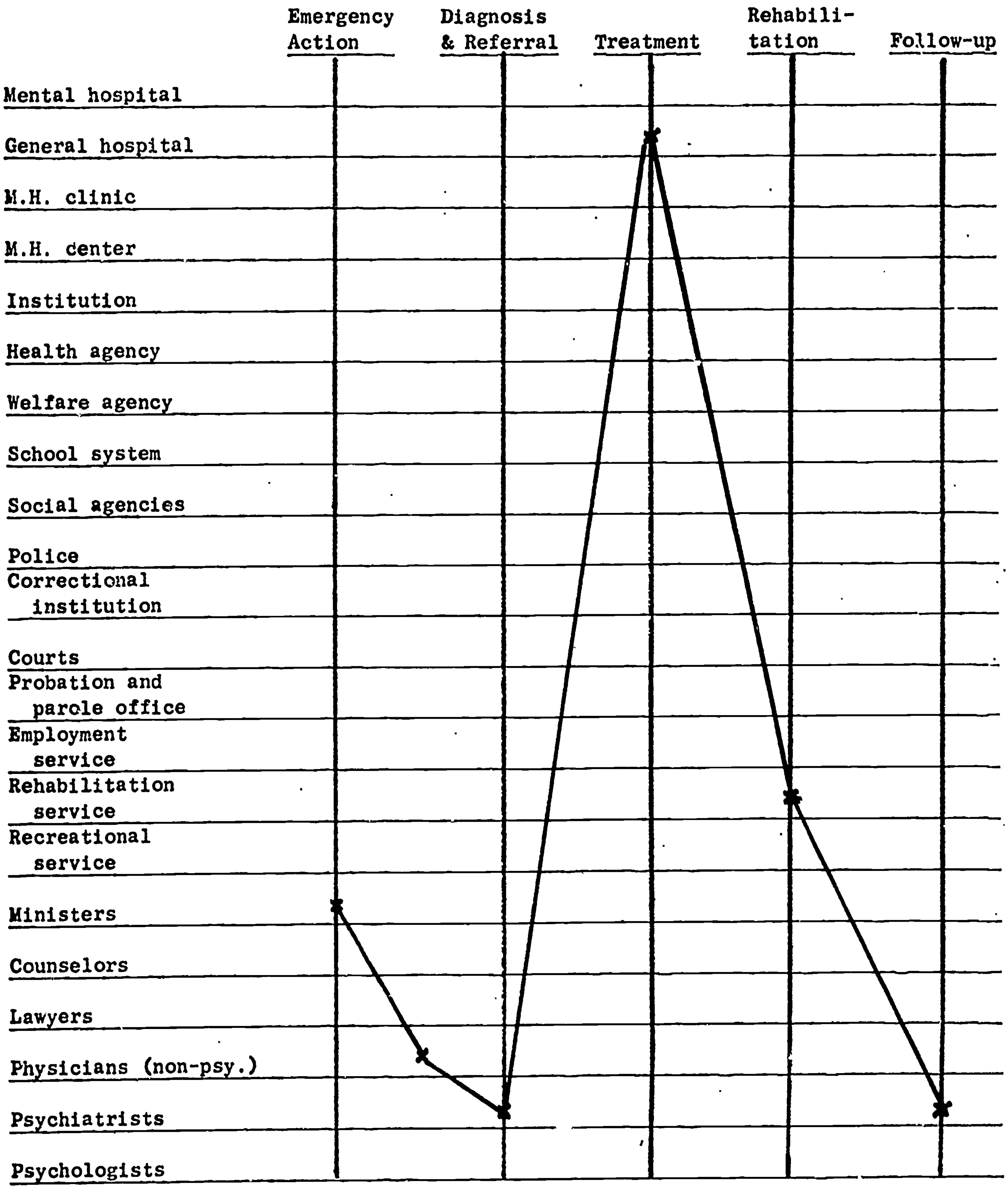

Pathways for the mentally ill.

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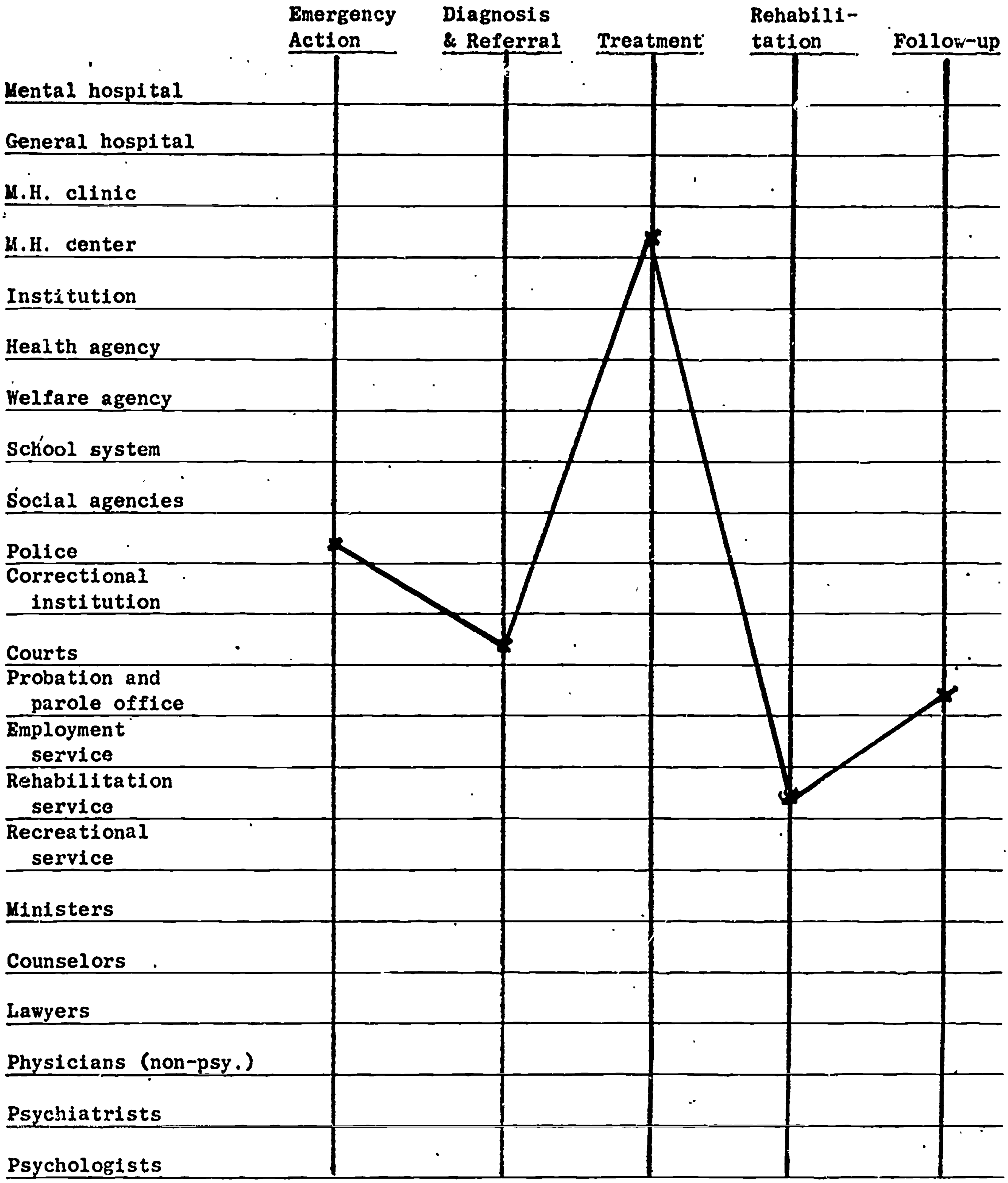
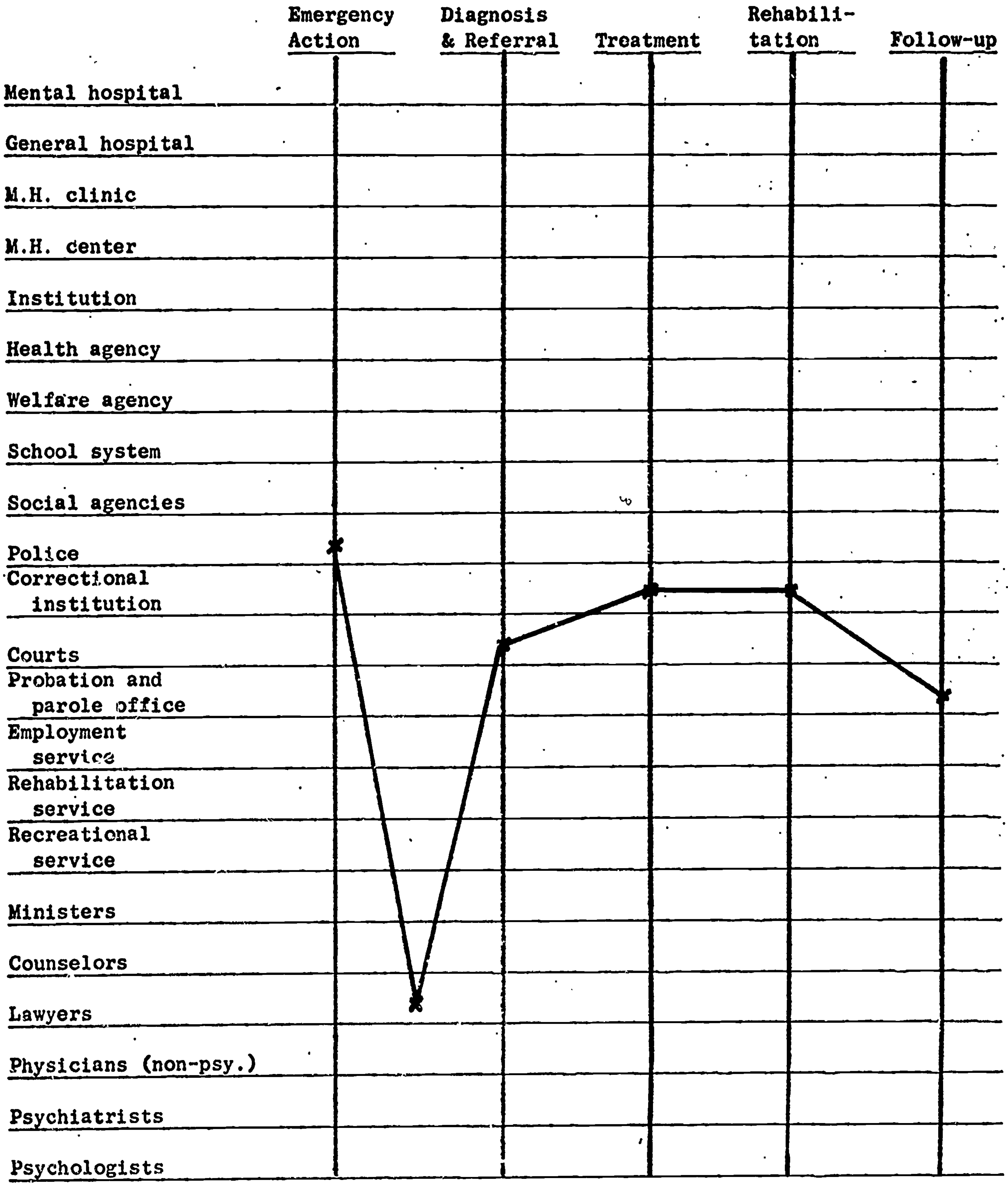


Pathways for the alcoholic

Model 4

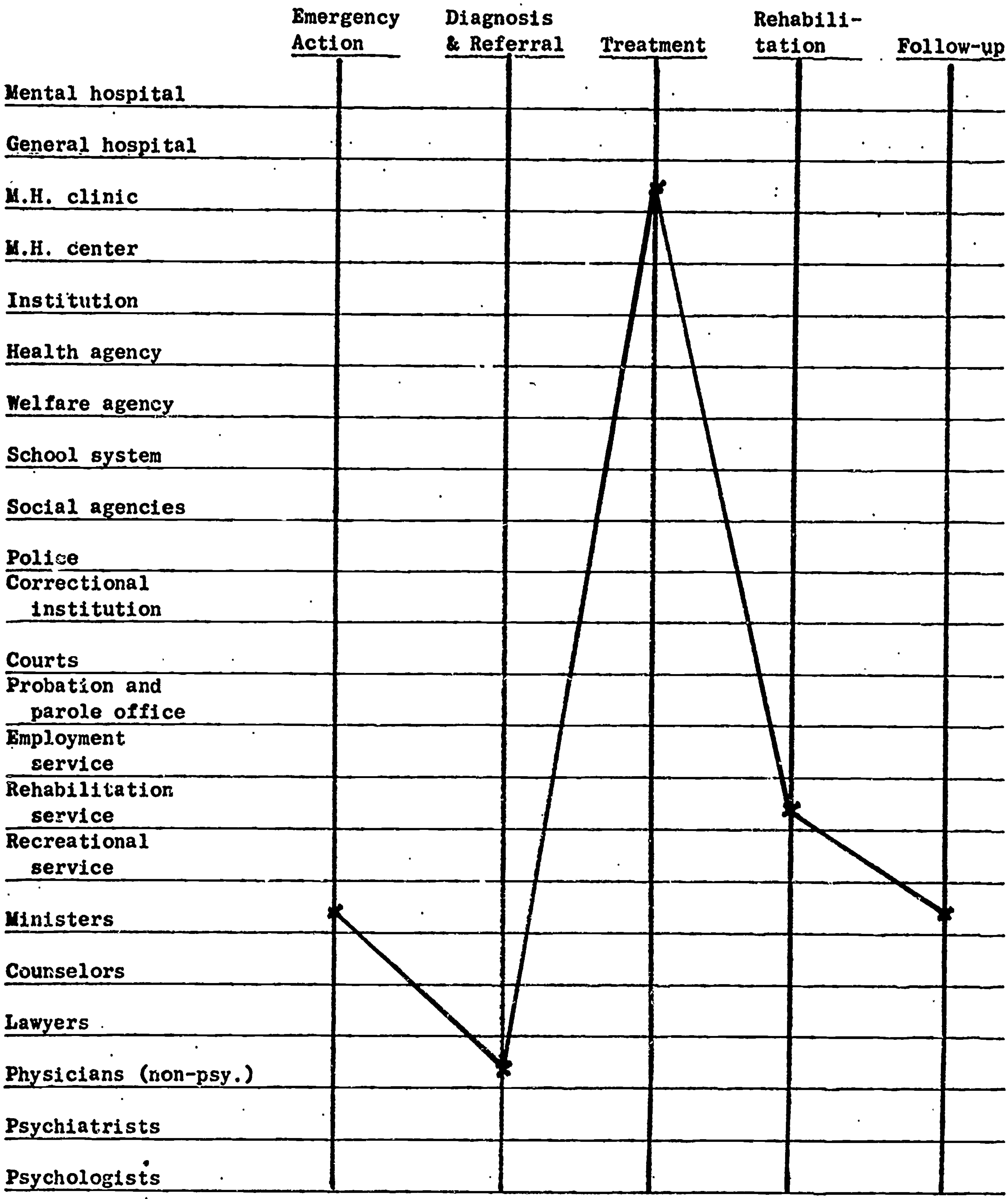
TRACKING THE INDIVIDUAL THROUGH THE SYSTEM



Pathways for the alcoholic

Model 4

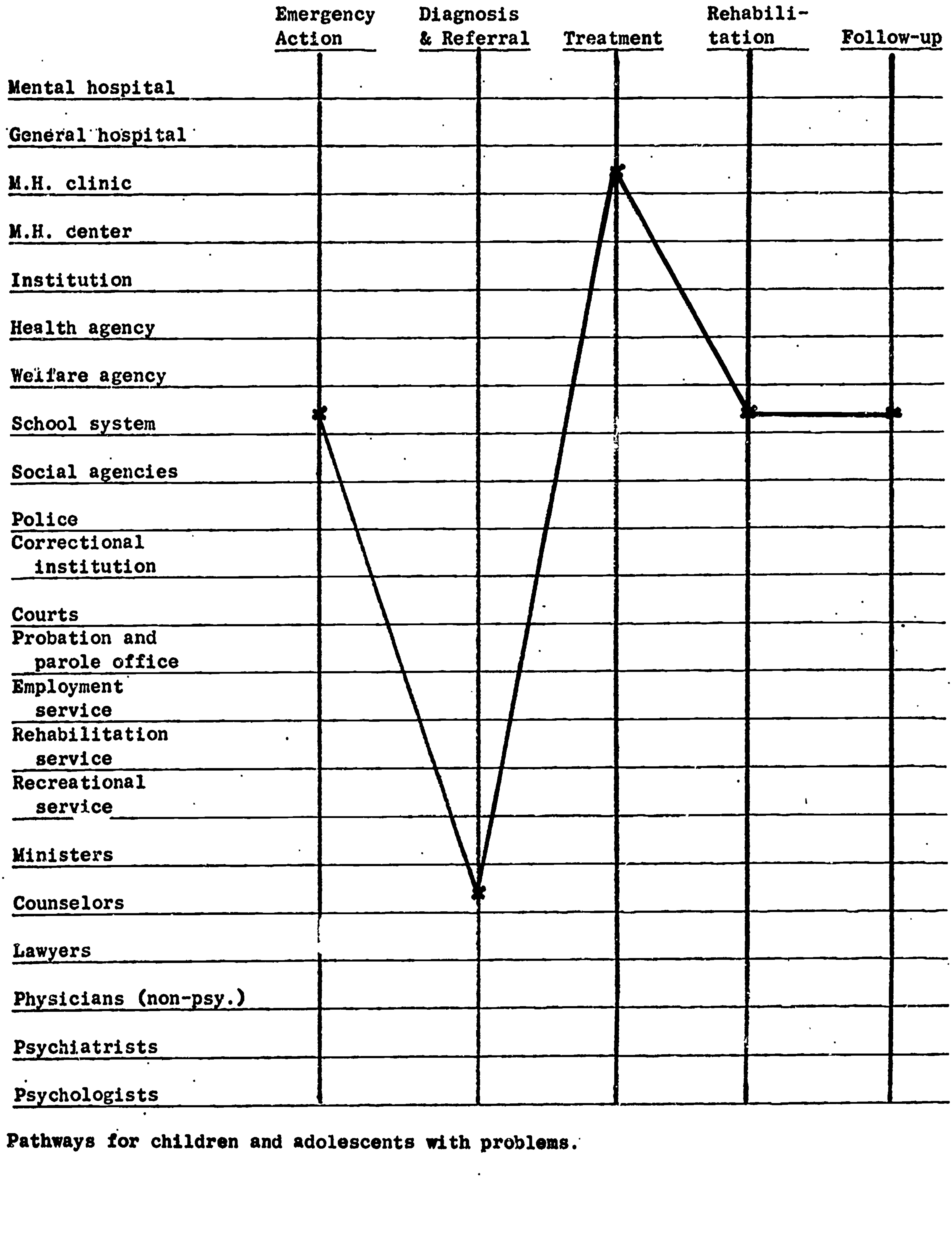
TRACKING THE INDIVIDUAL THROUGH THE SYSTEM



Pathways for the alcoholic

Model 4

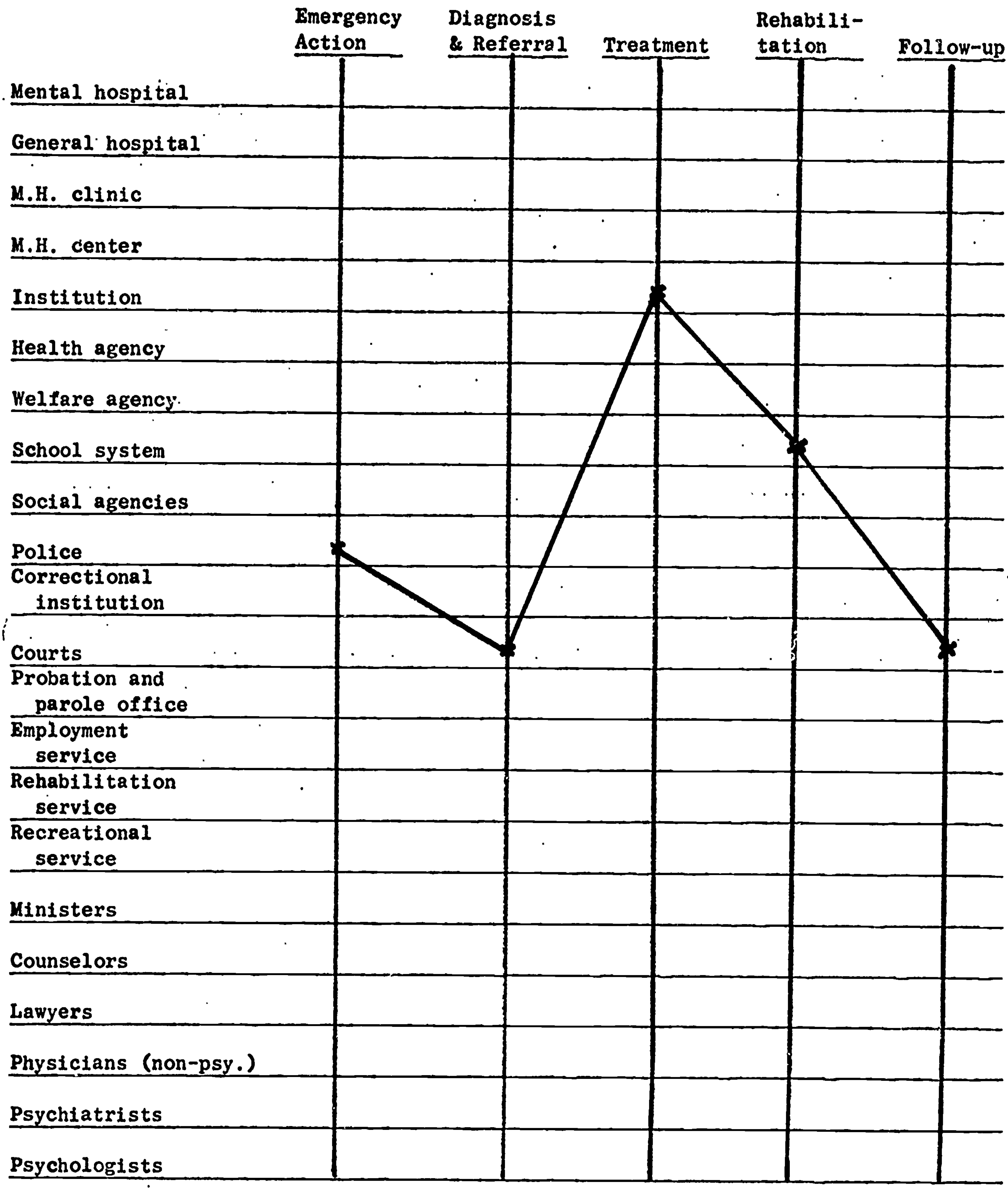
TRACKING THE INDIVIDUAL THROUGH THE SYSTEM



Pathways for children and adolescents with problems.

Model 4

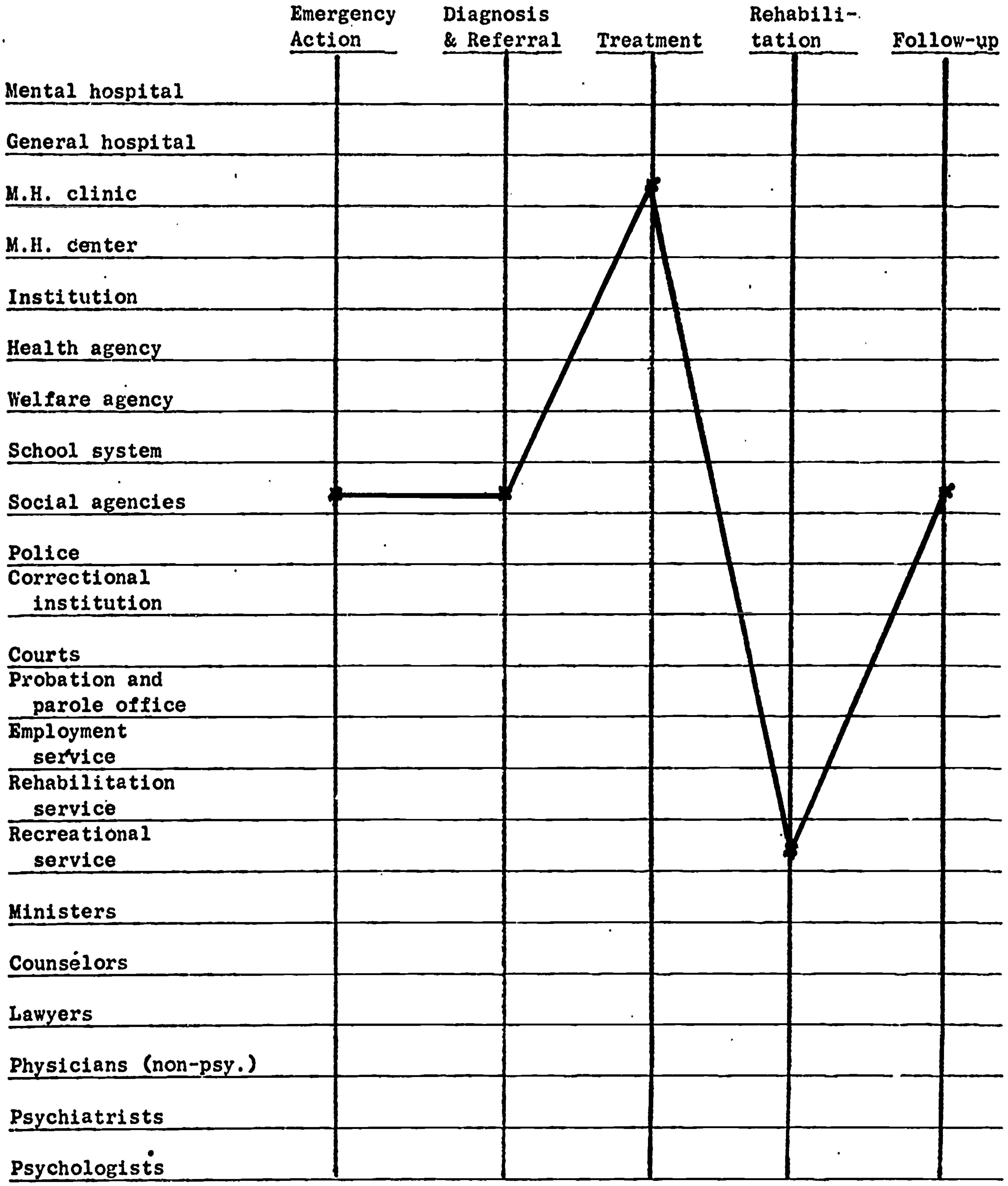
TRACKING THE INDIVIDUAL THROUGH THE SYSTEM



Pathways for children and adolescents with problems

Model 4

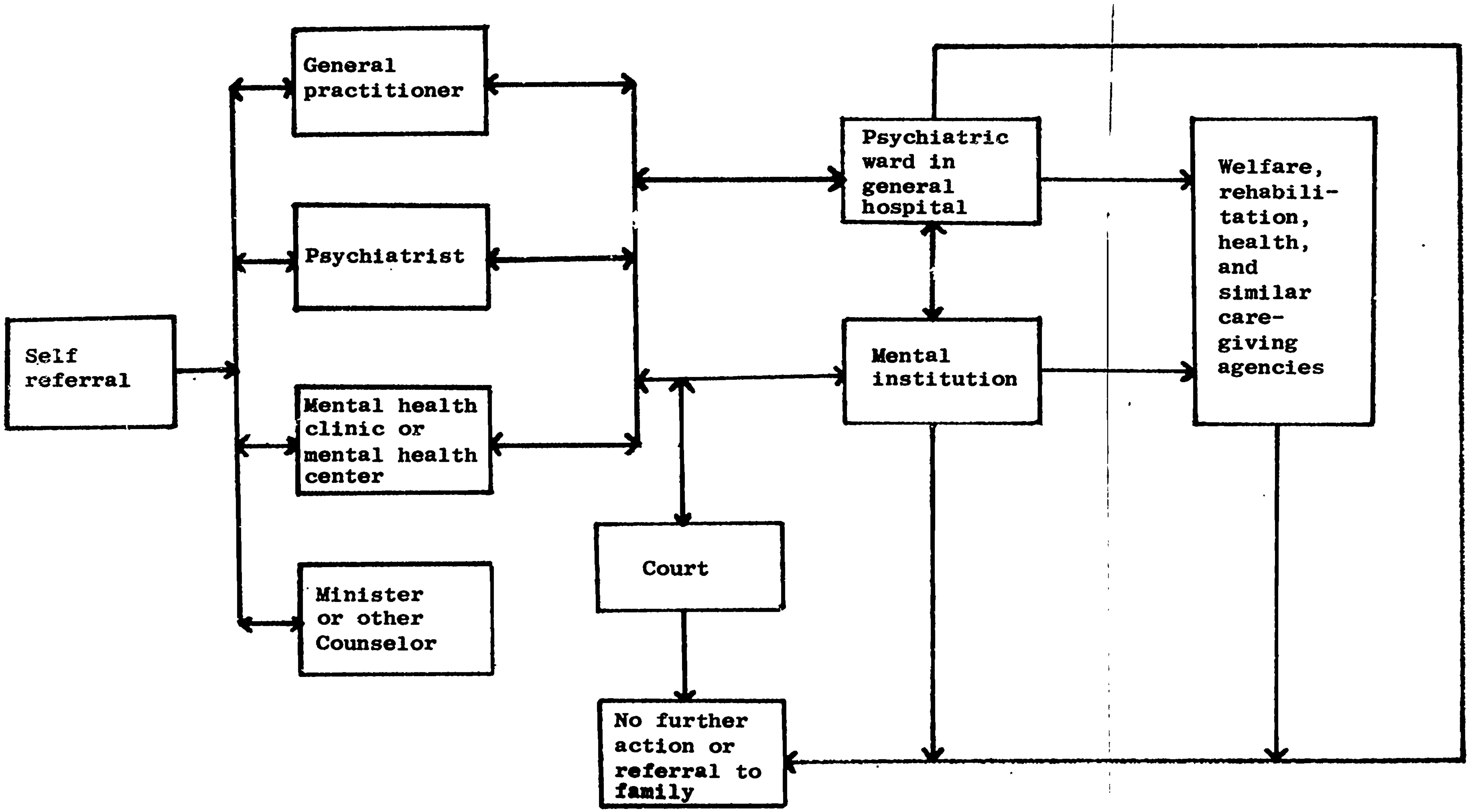
TRACKING THE INDIVIDUAL THROUGH THE SYSTEM



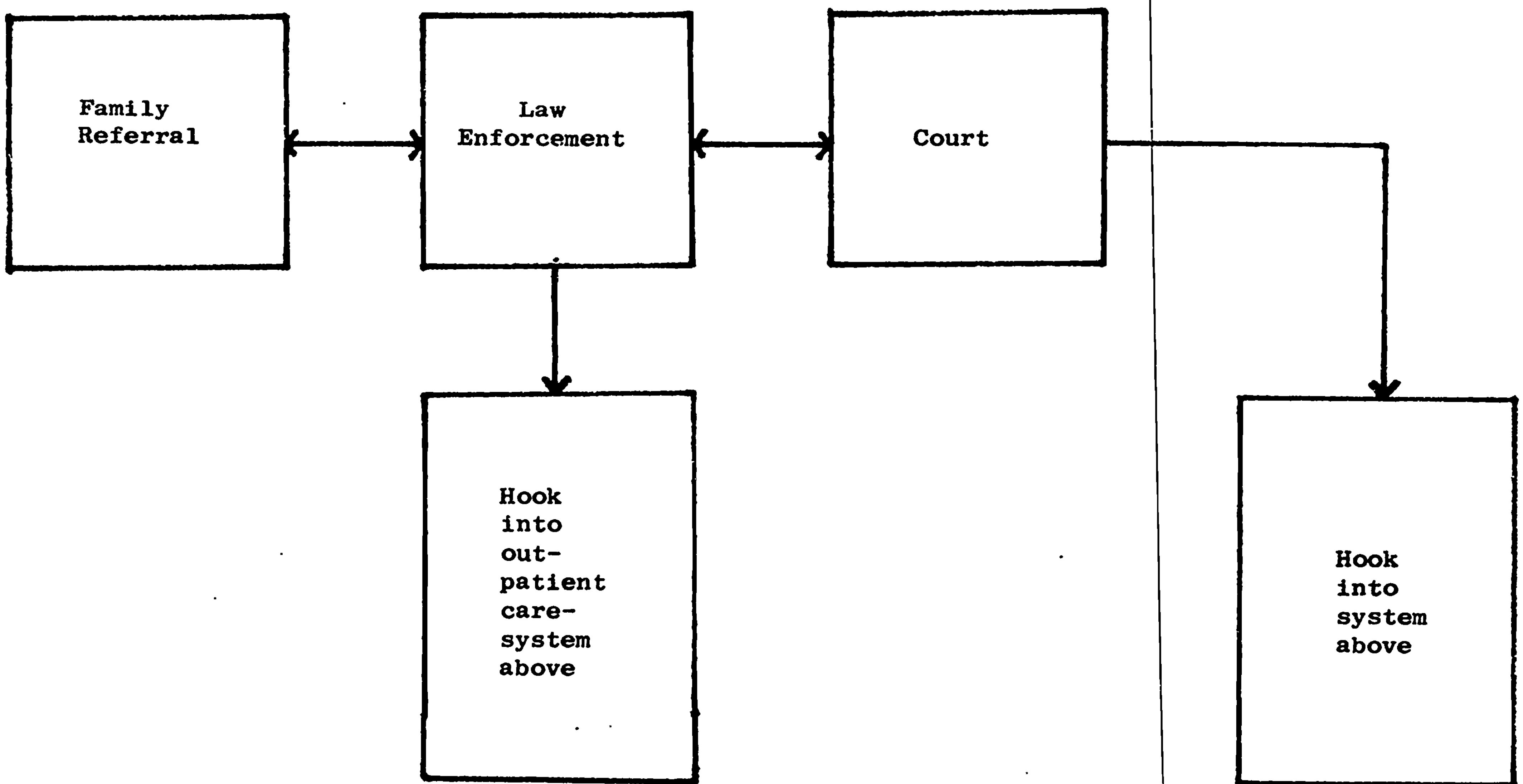
Pathways for children and adolescents with problems.

Model 5

ANALYZING THE CAREGIVING SYSTEM

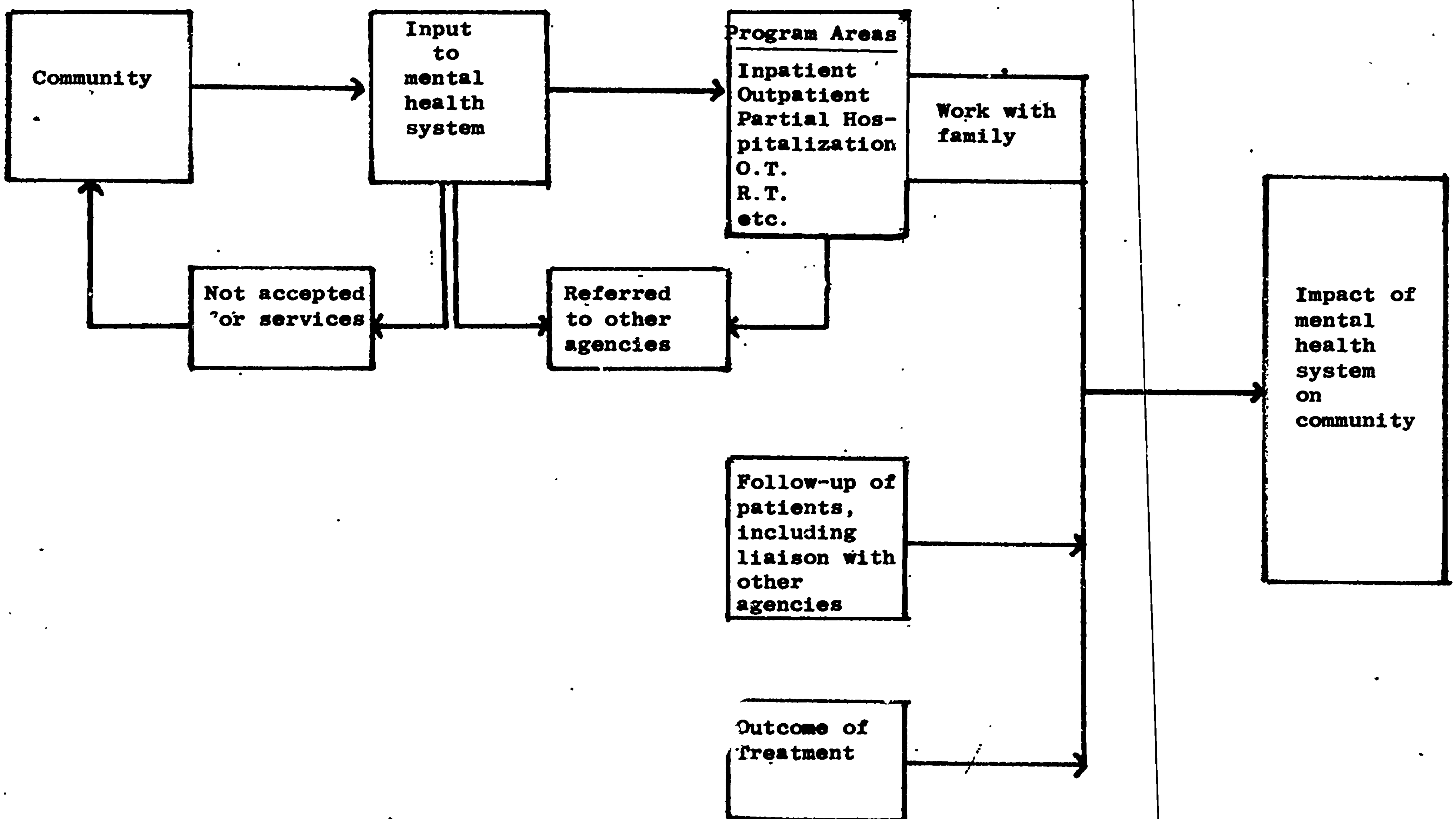


Model 5A


Family Referral
Law Enforcement
Court
Hook into out-patient care-system above
Hook into system above

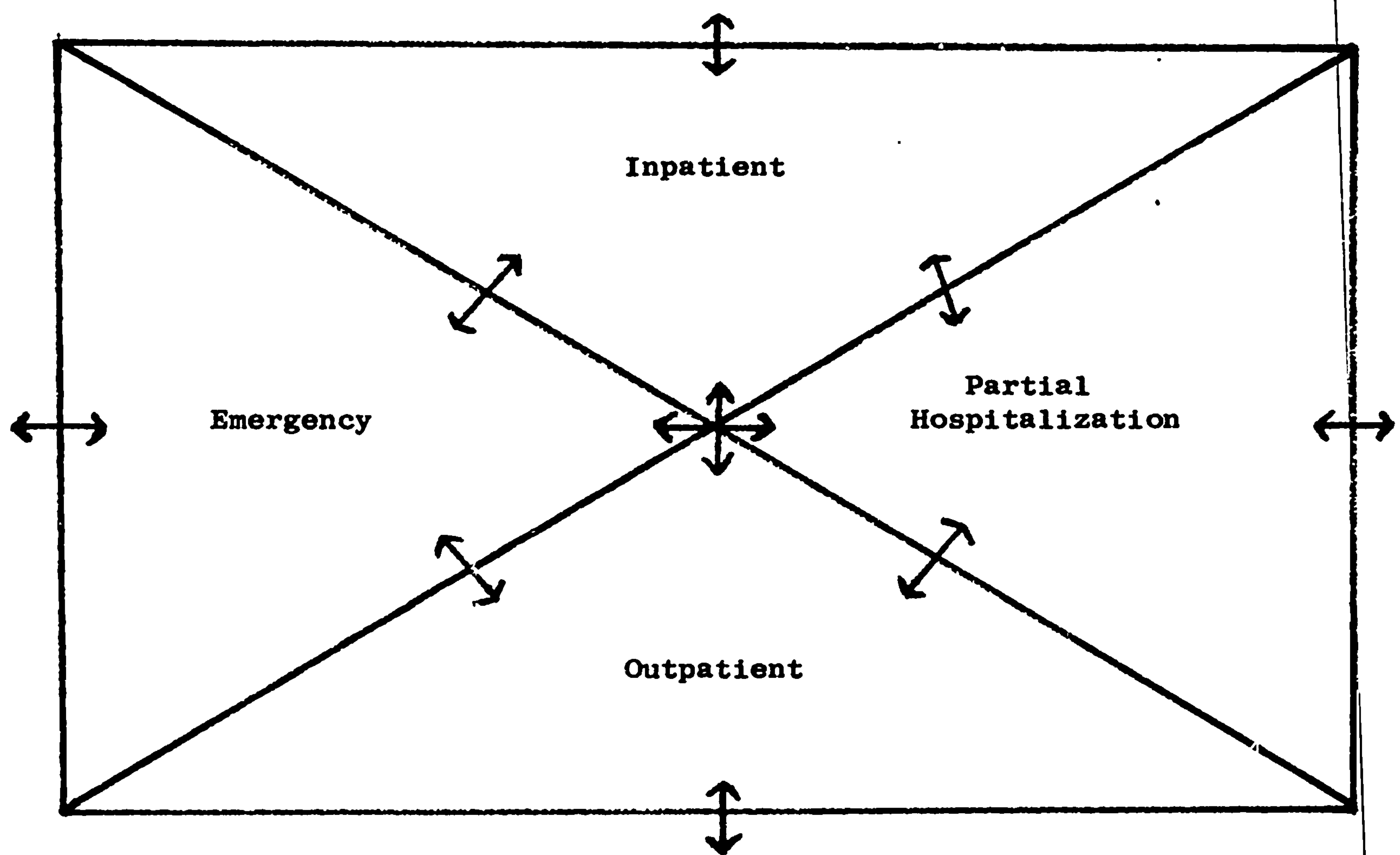
Model 6

Elements in a Mental Health System



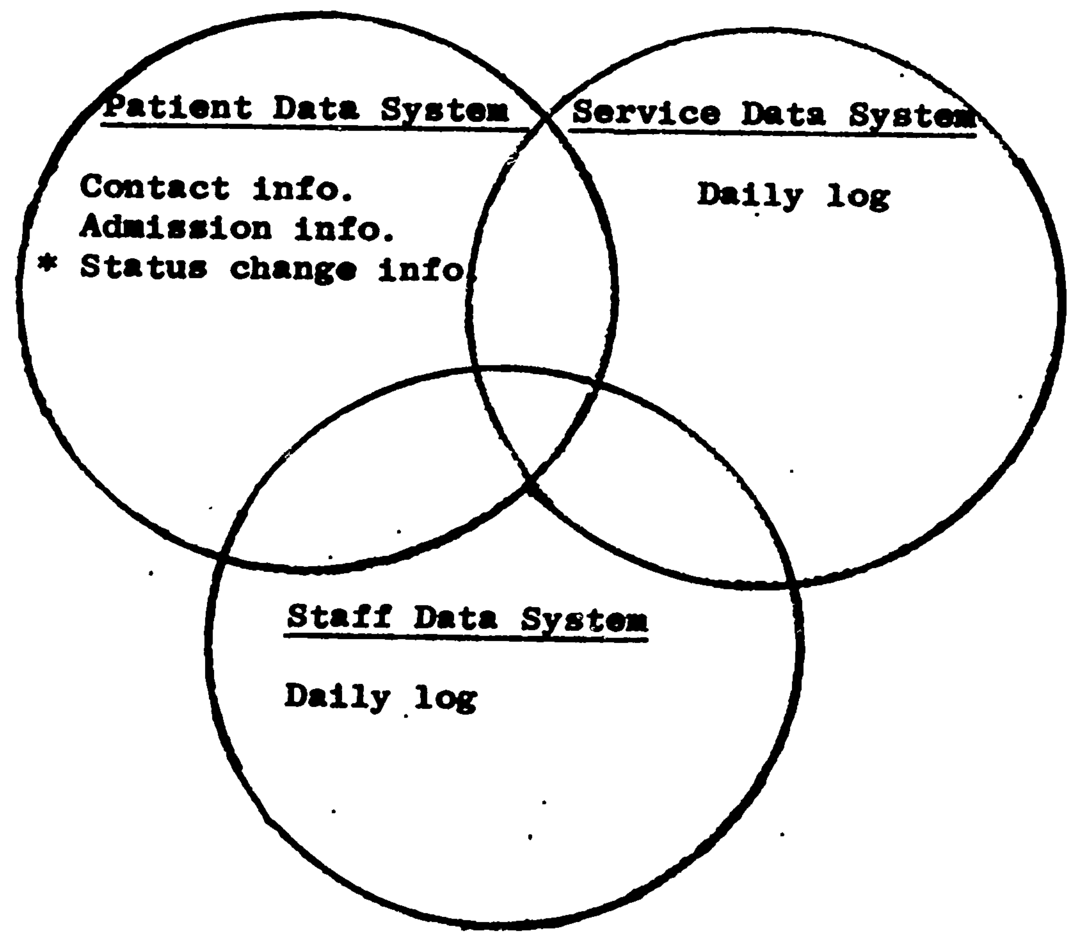
* See Model 6A

Model 6A



Inpatient
Emergency
Partial
Hospitalization
Outpatient

Model 6B



* Establish mutually exclusive status categories; no patient can be in more than one category at any one time.